

A Guide to Counting the MEA with the LAS: Mathematical Methods

Forward

The guide that follows demonstrates mathematical methods that can be used to combine the performance level a student demonstrates on the Maine Educational Assessment (MEA) with the collection of assessments that make up the certification portion of the local assessment system (LAS). These methods use certain recommended percentages and give examples of student performances based on specific local assessment systems. It should be remembered that districts have considerable latitude under Chapter 127 in both the design of their LAS and in how the MEA performance is counted for a student.

Maine law (Title 2-A, Section 6201) establishes the broad purposes for a system of state and local assessments: “There is a need for assessment information at both the state and local level to measure progress and ensure accountability regarding the system of learning results, which must be accomplished through a comprehensive system of local and state assessments, involving multiple measures to determine what each student knows and is about to demonstrate regarding the standards of the system of learning results.” Section 6201 (6) further states, “...The statewide assessment program [MEA] may not be the only criteria for judging student performance.” Chapter 127 Section 4.02 (C)(4) states, “The role of the Maine Educational Assessment (MEA) in the local assessment system shall be explicitly stated. Neither the MEA nor a commercially produced test may be the only measure of student achievement.”

This is the first edition of the guide. It is expected that it will be revised and expanded based on comments and suggestions that will be made as districts implement their local assessment system. We welcome your comments on this draft. We also welcome your questions as you work through the guide or work on developing your own system. Calculation questions should be directed to:

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A Guide to Counting the MEA with the LAS: Mathematical Methods

The purpose of this guide is to demonstrate how the policies for counting the MEA with the LAS can be implemented mathematically. The examples will show how

- different weightings for the MEA are included in the calculations,
- the calculations are performed at the content area level (mathematics and science) and cluster level (reading and writing with English language arts)
- the calculations are performed using the percent of point and pattern of performance methods.

Part I – How MEA Levels are Converted into Points

When combining MEA performance with an LAS score the performance levels of the MEA are converted into points in the same way points are assigned to levels in the LAS. That is, “exceeds standards” is 4 points, “meets standards” is 3 points, “partially meets standards” is 2 points, and “does not meet standards” is 1 point. If using the “percent of points” method these scores can be converted to percentage scores by thinking of the MEA scores achieved compared to the maximum possible score of 4 points. A “1 score” is $\frac{1}{4}$ or 25%. Similarly, scores of 2, 3 and 4 correspond to percentages of 50%, 75% and 100%.

Part 2 – Deciding When to Use the MEA Score

In the guide the examples will assume that the MEA result will be used only if the addition of the MEA benefits the student. For percentage of points the MEA will help the student only if the MEA performance score converts to a higher percentage than the percentage of points the student has earned on the set of LAS assessments. For pattern of performance the inclusion of the MEA score will help (or not hurt) the student only if the MEA score is as high or higher than the student’s most common score on the LAS. For both methods, if the student is working toward meeting standard on the LAS only “meets standards” (3) and “exceeds standards” (4) scores help the student. Even if the addition of “2 scores” from the MEA helps a student’s record at the time, the 2 scores added in will eventually have to be balanced with additional 3 scores or 4 scores making it harder for the student to meet standard in the long run.

Part 3 - Why is it proposed that the MEA count 15% to 20% of the combined MEA and LAS assessments?

In making this decision the members of the Policy Advisory Committee (PAC) looked at a variety of hypothetical student performances on the LAS and the effects of the addition of the MEA at different score levels and with the MEA scores given different weights. The original score on the LAS and final decision including the MEA were compared and the effect of the MEA evaluated. The idea that the MEA should be large enough to be meaningful and yet not discount the value of local assessments guided the work. Many of the cases PAC examined are in the examples that follow.

The tables that follow summarize the effects of the MEA on the LAS decision at different weights. PAC decided that the effect of the MEA at the 10% level was too small to be meaningful since the effect of a 3 MEA score only raises the overall score a little more than 1%. The effect at 25% was determined to be too great since it was believed that one score of 4 on the MEA should not be enough to overcome a performance on the LAS equivalent to all 2s (50%).

It should be remembered the 15%-20% level is a suggestion. Under Chapter 127 districts are free to determine if the MEA should be used and at what weight it should be counted.

In all the work that follows, it must be remembered that the cluster minimums must be met on the LAS before a student can “meet standard” with or without the MEA scores factored in!

The Effects of the Addition of MEA Scores on the Local Assessment System at Different Weights

| <i>When weighted at 10% If MEA performance level is:</i> | <i>required percentage of points on local assessments to meet the standard</i> |
|--|--|
| 4 | 58.3% |
| 3 | 61.1% |
| 2 | 63.9% |
| 1 | 66.7% |

| <i>When weighted at 15% if MEA performance level is:</i> | <i>required percentage of points on local assessments to meet the standard</i> |
|--|--|
| 4 | 55.9% |
| 3 | 60.3% |
| 2 | 64.7% |
| 1 | 69.0% |

| <i>When weighted at 20% if MEA performance level is:</i> | <i>required percentage of points on local assessments to meet the standard</i> |
|--|--|
| 4 | 53.1% |
| 3 | 59.4% |
| 2 | 65.6% |
| 1 | 71.9% |

| <i>When weighted at 25% if MEA performance level is:</i> | <i>required percentage of points on local assessments to meet the standard</i> |
|--|--|
| 4 | 50.0% |
| 3 | 58.3% |
| 2 | 66.7% |
| 1 | 75.0% |

Part 4 - How MEA Scores can be combined with the LAS at the Content Area Level using the “Percent of Points” Method.

The two methods that follow show two methods to do the computations to include the MEA using the percent of points method of standard setting. The two methods are algebraically equivalent and will yield the same result. The first method is a simpler computation. The second method is more “transparent” showing the effect of the MEA more clearly, but has many more steps. The computations in the second method can, however, be used more easily to find how many “replacement points” the student needs to meet standards on the combined LAS and MEA decision.

Method 1 – The Weighted Scores Method

Essentially the MEA score is combined with the LAS score much like an optional test could be added to a set of tests as an additional chance for a student to demonstrate her or his level of achievement. This is not a replacement but the inclusion of additional information. The general formula can be described as:

$$(\% \text{weight of MEA})(\% \text{ score MEA}) + (\% \text{weight LAS})(\% \text{ score LAS}) = \text{combined weighted score}$$

In using the formula, percentages will be expressed as decimals during the calculations and the decimals converted into percentages for final answers after the calculations are completed.

Case 1: Ernie (MEA weight = 20%)

Consider Ernie, who obtained mostly 2’s and some 3’s on the local assessments for science. He has accumulated 67 of 120 possible points for a percentage of 55.8% (partially meets). He needs an additional 8 points to reach the required 62.5% (75/120) for certification.

Ernie’s scores (55.8% of total points possible on local assessments)

| Enrichment Scores (55.83% of total points possible on local assessments) | | | | | | | | | | | | | |
|--|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 2 | | | | 2 | 2 | |
| #2 | | | | | 3 | | | | | 2 | 2 | | |
| #3 | | | 2 | | | | | | | | 3 | 2 | |
| #4 | | | | | 2, 2 | | | | | | | | |
| #5 | | 2, 2 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 2, 2 | | | | 2 | 2 |
| #7 | | | | | | | | 2 | | 2 | 2 | 3 | |
| #8 | | | | | | 2 | | | | 2 | | 2 | |
| #9 | 2 | | | | | | | | | 3 | 2 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 11/20 | | | 12/20 | | | 11/20 | | | 33/60 | | | |
| 67/120 total points earned on local assessments (55.83%) | | | | | | | | | | | | | |

If Ernie partially meets standards on the MEA, a score of 2 is assigned. This corresponds to 50% of the possible MEA points. **Since 50% is less than 55.83%, combining the MEA score of 2 with the LAS will not benefit Ernie so the MEA score is not combined with the LAS score.**

If Ernie meets standards on the MEA, a score of 3 is assigned. This corresponds to 75% of the possible MEA points. Since 75% is greater than the 55.83% earned on the LAS, the addition of the MEA will benefit Ernie. To include the MEA at the 20% level the combined score will be 20% of MEA percentage plus 80% of the LAS percentage. For this example Ernie's combined score is computed:

$$(\text{weight of MEA})(\text{percentage MEA}) + (\text{weight LAS})(\text{percentage LAS}) = \text{combined weighted score} \\ (0.20)(0.75) + (0.80)(55.83) = 0.15 + 0.44664 = 0.59644 \text{ or } 59.64\%$$

With a score of 59.64%, **Ernie still partially meets standards, but he has benefited from the inclusion of the MEA.** His total percentage is higher. He now needs only 4 replacement points to meet standard.

If Ernie exceeds standards on the MEA, a score of 4 is assigned. This corresponds to 100% of the possible MEA points. Since 100% is greater than the 55.83% earned on the LAS, the addition of the MEA will benefit Ernie. For this example Ernie's combined score is computed:

$$(0.20)(1.00) + (0.80)(55.83) = 0.20 + 0.44664 = 0.64644 \text{ or } 64.64\%$$

With a score of 64.64%, Ernie now meets standards on the combined MEA and LAS.

Case 2 Ernie again at the 15% level

If Ernie partially meets standards on the MEA, a score of 2 (50%) is assigned. Since 50% is less than 55.83%, combining the MEA score of 2 with the LAS will not benefit Ernie so the MEA score is not combined with the LAS score. **This is true no matter what weight is assigned to the MEA.**

If Ernie meets standards on the MEA, a score of 3 (75%) is assigned. To include the MEA at the 15% level the combined score will be 15% of MEA percentage plus 85% of the LAS percentage. For this example Ernie's combined score is computed:

$$(\text{weight of MEA})(\text{percentage MEA}) + (\text{weight LAS})(\text{percentage LAS}) = \text{combined weighted score} \\ (0.15)(0.75) + (0.85)(55.83) = 0.1125 + 0.474555 = 0.58706\%$$

With a score of 58.7%, **Ernie still partially meets standards, but he has benefited from the inclusion of the MEA.** His total percentage is about 1% lower than using the MEA at a 20% weight and he will need to do 5 replacements to meet standards on the combined LAS and MEA.

If Ernie exceeds standards on the MEA, a score of 4 (100%) is assigned. This corresponds to 100% of the possible MEA points. At the 15% MEA weight Ernie's combined score is computed:

$$(0.15)(1.00) + (0.85)(55.83) = 0.15 + 0.47456 = 0.62456 \text{ or } 62.5\% \text{ (rounded to the nearest 0.1\%)}$$

With a score of 62.5%, Ernie now meets standards on the combined MEA and LAS.

Method 2 – Combined Points Method

In this method, the number of possible points in the LAS is taken into account along with the desired weight of the MEA score to compute the possible points that the MEA will add into the combined MEA and LAS. This method is more complex. It does, however, show the size of the MEA contribution. It is also more “generalizable” and can be used for the inclusion of MEA tests of reading and writing that must be added at the cluster level (see later examples). If one desires to use just one method, this is the method. Ernie will again be used as the first example.

Case 1: Ernie’s scores (55.8% of total points possible on local assessments)

| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
|---|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 2 | | | | 2 | 2 | |
| #2 | | | | | 3 | | | | | 2 | 2 | | |
| #3 | | | 2 | | | | | | | | 3 | 2 | |
| #4 | | | | | 2, 2 | | | | | | | | |
| #5 | | 2, 2 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 2, 2 | | | | 2 | 2 |
| #7 | | | | | | | | 2 | | 2 | 2 | 3 | |
| #8 | | | | | | 2 | | | | 2 | | 2 | |
| #9 | 2 | | | | | | | | | 3 | 2 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 11/20 | | | 12/20 | | | 11/20 | | | 33/60 | | | |
| 67/120 total points earned on local assessments | | | | | | | | | | | | | |

To compute the possible point value of the MEA at the 20% level, one solves the equation:

$$x/(120+x) = 0.20 \Rightarrow x = 0.20(120+x) \Rightarrow x = 24 + 0.20x \Rightarrow 0.80x = 24 \Rightarrow x = 30 \text{ points.}$$

If Ernie meets standards on the MEA (score of 3) he has earned $\frac{3}{4}$ (75%) of the possible points.
75% of 30 = 22.5 points

Total points possible on the LAS plus the MEA = $120 + 30 = 150$.

Total points earned on the LAS plus the MEA = $67 + 22.5 = 89.5$.

Final percentage = $89.5/150 = 59.7\%$. Ernie still **partially meets standards**, but needs fewer replacements (4) to meet standards.

If Ernie exceeds standards on the MEA (score of 4) he has earned 100% of the possible points (all 30).

Total points possible on the LAS plus the MEA = $120 + 30 = 150$.

Total points earned on the LAS plus the MEA = $67 + 30 = 97$.

Final percentage = $97/150 = 64.7\%$. **Ernie meets standards on the combined measures.**

Case 2: Fran's scores (60.0% of total points possible on local assessments)

| Case 2.1 Kim's scores (66.6% of total points possible on local assessments) | | | | | | | | | | | | | |
|---|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 3 | | | | 2 | 3 | |
| #2 | | | | | 3 | | | | | 2 | 2 | | |
| #3 | | | 2 | | | | | | | | 3 | 2 | |
| #4 | | | | | 2, 2 | | | | | | | | |
| #5 | | 2, 2 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 2, 2 | | | | 2 | 2 |
| #7 | | | | | | | | 3 | | 3 | 2 | 3 | |
| #8 | | | | | | 2 | | | | 2 | | 2 | |
| #9 | 3 | | | | | | | | | 3 | 2 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 12/20 | | | 12/20 | | | 13/20 | | | 35/60 | | | |
| 72/120 total points earned on local assessments | | | | | | | | | | | | | |

To compute the possible point value of the MEA at the 15% level, one solves the equation:

$$x/(120+x) = 0.15 \Rightarrow x = 0.15(120+x) \Rightarrow x = 18 + 0.15x \Rightarrow 0.85x = 18 \Rightarrow x = 21.18 \text{ points.}$$

If Fran meets standards on the MEA (score of 3) she has earned $\frac{3}{4}$ (75%) of the possible points.
75% of 21.18 = 15.89 points

Total points possible on the LAS plus the MEA = 120 + 21.18 points = 141.18

Total points earned on the LAS plus the MEA = 72 + 15.89 = 87.89.

Final percentage = 87.89/141.18 = 59.7%. Fran **still partially meets standards**, but needs only one replacement point to meet standards. (Fran would meet standards if the MEA were weighted at 20%)

If Fran exceeds standards on the MEA (score of 4) she has earned 100% of the possible points (all 21.18).

Total points possible on the LAS plus the MEA = 120 + 21.18 = 141.18

Total points earned on the LAS plus the MEA = 72 + 21.18 = 93.18.

Final percentage = 93.18/141.18 = 66.0%. **Fran meets standards on the combined measures.**

Method 3: English Language Arts

For English language arts the inclusion of the MEA for certification decisions is more complicated than with the subjects of science and mathematics. There are separate tests for assessing reading and writing. In addition, the MEA does not measure all of ELA. The MEA Reading test assesses performance indicators from ELA Cluster 1 Reading and Viewing. The MEA Writing Test assesses performance indicators from ELA Cluster 2 Writing and Speaking. ELA Cluster 3 is not assessed by the MEA. The Cluster 3 indicators are more appropriately assessed locally than with a statewide, on-demand assessment.

Because of the situation described above, the following methods are proposed for using the MEA tests in making certification decisions in ELA. Instead of adding the MEA score to the content area, combine the MEA in reading as value added with Cluster 1 and combine the MEA in Writing as value added with Cluster 2. Because these two clusters represent only $\frac{2}{3}$ of the content area, to get the same benefit in ELA as in mathematics and science it is suggested that the weight of the MEA in each cluster be between 25% and 30% rather than the 15%-20% levels suggested for the content area as a whole in science and math ($\frac{2}{3} \times 30\% = 20\%$).

The examples that follow show how to do the needed calculations using both the “percent of points” method of standard setting. The examples also illustrate what to do when the student meets standards on both MEA tests, meets standards on one test but not on the other, and when students exceed the standard on one test. The examples also demonstrate how to use different weightings for the MEA scores.

It is important to note that points are not converted into percents until the end of the process. This allows for the fact that the three clusters can have different numbers of points in the LAS. The first step is to find the total possible points that can be contributed by the MEA at the chosen “weight” in the given cluster or clusters. Then the score on the MEA is used to determine the points “earned” on the MEA for the cluster or clusters. Note that Cluster 3 is unaffected by the MEA. The points earned for the three clusters are combined. The points possible for the three clusters are combined. The sum of the points earned is divided by the sum of the points possible to arrive at the percentage for the combined measure.

**Case 1: Zoe meets standard on both the MEA reading and MEA Writing Tests
(MEA weighted at 30%)**

Zoe's Performance on the Local Assessment System

| | Reading and Viewing | | | Writing and Speaking | | | Integrated Literacy | |
|--------------------------------|---------------------|------|---|----------------------|------|---|---------------------|------|
| | A | B | D | E | F | G | C | H |
| Assessment | | | | | | | | |
| #1 | 3 | | | | | | 3 | |
| #2 | | | | | 2 | | | |
| #3 | | | 2 | | | | 3 | |
| #4 | | | | | 2, 2 | | | |
| #5 | | 2, 2 | | | | | | |
| #6 | | | | 3 | | | | 2, 2 |
| #7 | | | | | | | | 4 |
| #8 | | | | | | 2 | | |
| #9 | 3 | | | | | | | |
| #10 | | | | 2 | | | | |
| points earned: | 12/20 | | | 13/24 | | | 14/20 | |
| Total points = 39/64 or 60.94% | | | | | | | | |

Zoe meets standards (3 or 75%) on MEA reading and MEA writing tests.

Reading – Total LAS points possible 20.

To find the number of points contributed by the MEA to make it worth 30% of the total:

Solve $(x)/(20+x) = 0.30 \Rightarrow x = 6 + 0.30x \Rightarrow 0.70x = 6 \Rightarrow x = 8.571$ points

The MEA earned points are 75% (from the score of 3) of 8.571 points which is 6.423 points.

Total Points for Reading is 18.423 out of 28.571 points.

Writing – Total LAS points possible 24

To find the number of points contributed by the MEA to make it worth 25% of the total:

Solve $(x)/(24+x) = 0.30 \Rightarrow x = 7.2 + 0.30x \Rightarrow 0.70x = 7.2 \Rightarrow x = 10.286$ points

The MEA points earned are 75% (from the score of 3) of 10.286 points which is 7.71 points.

Total Points for Writing are 20.71 out of 34.286 points.

For Cluster 3 there is no MEA contribution.

The points are 14/20.

Points earned = 18.423 (Cluster 1+ MEA reading) + 20.71 (Cluster 2 + MEA writing) + 14 (Cluster 3)= 53.133

Points possible =28.571(Cluster 1+ MEA reading)+ 34.286 (Cluster 2 + MEA writing)+ 20 (Cluster 3) = 82.857

$\frac{53.133}{82.857} = 64.1\%$. **Zoe meets standards for ELA in the LAS with the addition of the MEA scores.**

Case 2: Zoe meets standards on the MEA writing test, but not on the Reading test (MEA weighted at 25%)

Zoe's Performance on the Local Assessment System

| | Reading and Viewing | | | Writing and Speaking | | | Integrated Literacy | |
|--------------------------------|---------------------|------|---|----------------------|------|---|---------------------|------|
| | A | B | D | E | F | G | C | H |
| Assessment | | | | | | | | |
| #1 | 3 | | | | | | 3 | |
| #2 | | | | | 2 | | | |
| #3 | | | 2 | | | | 3 | |
| #4 | | | | | 2, 2 | | | |
| #5 | | 2, 2 | | | | | | |
| #6 | | | | 3 | | | | 2, 2 |
| #7 | | | | | | | | 4 |
| #8 | | | | | | 2 | | |
| #9 | 3 | | | | | | | |
| #10 | | | | 2 | | | | |
| points earned: | 12/20 | | | 13/24 | | | 14/20 | |
| Total points = 39/64 or 60.94% | | | | | | | | |

Reading

The 2 score in MEA reading corresponds to 50%. This is less than the 60.94% for the content area. The reading score will not be helpful to Zoe so it is ignored.

The total point values for Cluster 1 stay at 12/20.

Writing

The 3 score in MEA writing corresponds to 75%. This will be helpful to Zoe.

To find the number of points contributed by the MEA to make it worth 25% of the total:

$$\text{Solve } (x)/(24+x) = 0.25 \Rightarrow x = 0.25(24+x) \Rightarrow x = 6 + 0.25x \Rightarrow 0.75x = 6 \Rightarrow x = 8 \text{ points}$$

The MEA points earned are 75% (from the score of 3) of 8 points which is 6 points.

$$(.75)(8) = 6$$

Total points earned for Cluster 2 are 13 (from the LAS) +6 (from the MEA writing score) =19 points

Total points available for Cluster 2 are 24 (from the LAS) and 8 (from the MEA writing test) = 32 points

The Cluster 2 score with the MEA added in is 19/32.

The Cluster 3 score stays at 14/20.

To calculate the final determination for ELA as a whole:

Points earned = 12 (Cluster 1) + 19 (Cluster 2 + MEA writing) + 14 (Cluster 3) = 45

Points possible = 20 (Cluster 1) + 32 (Cluster 2 + MEA writing) + 20 (Cluster 3) = 72

$$\frac{45}{72} = 62.5\%.$$

Zoe meets standards for ELA in the LAS with the addition of the MEA score in writing.

Case 3 Zoe meets standards on MEA reading and partially meets standards on MEA writing (Weight of the MEA= 25%).

Zoe's Performance on the Local Assessment System

| Use of Performance on the Local Assessment System | | | | | | | | |
|---|---------------------|------|---|----------------------|------|---|---------------------|------|
| | Reading and Viewing | | | Writing and Speaking | | | Integrated Literacy | |
| | A | B | D | E | F | G | C | H |
| Assessment | | | | | | | | |
| #1 | 3 | | | | | | 3 | |
| #2 | | | | | 2 | | | |
| #3 | | | 2 | | | | 3 | |
| #4 | | | | | 2, 2 | | | |
| #5 | | 2, 2 | | | | | | |
| #6 | | | | 3 | | | | 2, 2 |
| #7 | | | | | | | | 4 |
| #8 | | | | | | 2 | | |
| #9 | 3 | | | | | | | |
| #10 | | | | 2 | | | | |
| points earned: | 12/20 | | | 13/24 | | | 14/20 | |
| Total points = 39/64 or 60.94% | | | | | | | | |

Reading – Total LAS points possible 20.

To find the number of points contributed by the MEA to make it worth 25% of the total:

Solve $(x)/(20+x) = 0.25 \Rightarrow x = 5 + 0.25x \Rightarrow 0.75x = 5 \Rightarrow x = 6.667$ points

The MEA earned points are 75% (from the score of 3) of 6.667 points which is 5 points.

Total Points for Reading is 17 out of 26.667 points.

Writing – Total LAS points possible 24.

The partially meets level in writing will not help Zoe (50%<60.94%) so MEA writing is ignored.

Total Points for writing stays at 13 points out of 24 possible points.

The Cluster 3 score is 14 points out of 20 possible points.

The calculations yield:

Points earned = 17 (Cluster 1 + MEA reading) + 13 (Cluster 2) + 14 (Cluster 3) = 44

Points possible = 26.667 (Cluster 1 + MEA reading) + 24 (Cluster 2) + 20 (Cluster 3) = 70.667

$\frac{44}{70.667} = 62.3\%$. Zoe does not meet standards for ELA in the LAS with the addition of the MEA score.

Zoe will need to do one replacement task and score at higher levels than she originally did to meet standards. The larger number of scores in Cluster 2 than in Cluster 1 explains why the MEA reading score by itself was not enough to boost Zoe to meeting standard but the MEA writing score was.

Part 5 – How the MEA can be combined with the LAS – “Pattern of Performance” Method

When working with the mode using the strictest possible definition of mode, strange things can happen as values are added in. For example, in a case where a student has a performance of nine 3s, ten 2s, and two 1s the mode is 2. If four scores of 3 are added in from the MEA, the resulting distribution is thirteen 3s, ten 2s and two 1s. The mode is now 3. If, however, the student exceeds standards on the MEA and four scores of 4 are added, the resulting distribution is four 4s, nine 3s, ten 2s and two 1s. The mode stays at 2. This result seems contradictory in that higher performance has led to a lower score.

Another problem exists if the distribution is fairly uniform. For example, if a student has eight 3s, seven 2s, and seven 1s the mode is 3 and the student could be said to meet standards even though she met standards only 36% of the time. Similarly a student with seven 4s, seven 3s and eight 2's would be categorized as partially meeting the standard even though the student met or exceeded standards 64% of the time.

Districts that choose to use “pattern of performance” can choose to develop their own way of applying the standard.

For purposes of this guide, however, the following rules shall be used:

- 1) A student's level shall be defined as the score that happened at least one-half of the time.
- 2) A score can be moved to a lower score if it helps the student.

Example 1 (cut and dried)

A student has scores of one 4, twelve 3's, seven 2's and one 1. There are twelve 3's out of 21 scores so the “pattern of performance” is classified as a 3, and the student meets standards.

Example 2 (not so cut and dried)

A student has scores of six 4s, five 3's, seven 2's and one 1. The strict mode is 2, but the student has met or exceeded standards on eleven of nineteen occasions. The scores of 4 are changed to 3s and the resulting distribution of eleven 3s, seven 2s and one 1 shows a clear pattern of meeting standards (3).

Example 3 (not at all cut and dried)

A student has scores of eight 3's, five 2's and seven 1's. There are eight 3's out of 20 scores so the “pattern of performance” is NOT classified as a 3, since a score of 3 did not show up at least $\frac{1}{2}$ of the time. The student partially meets standards. The scores of 3 become scores of 2 and the resulting distribution of thirteen 2s and seven 1s strongly shows a mode of 2.

Another facet of the mode that needs to be addressed is that the scores need to be whole numbers to be used. Fractional values are not helpful. Tables are presented to show the number of scores the MEA can contribute to the combined LAS and MEA score at the various weights. Note that the whole number values of the number of performance indicator scores counted yield percents between 15% and 20% for the content area and between 25% and 30% at the cluster level.

Table of MEA Scores Contributed Based on the Number of Performance Indicator Scores in the LAS for the Content Area

| Number of PI scores in LAS | Number of MEA scores used | resulting percent weight | Number of MEA scores used | resulting percent weight | Number of MEA scores used | resulting percent weight | Number of MEA scores used | resulting percent weight |
|----------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| 15 | 3 | 16.7% | | | | | | |
| 16 | 3 | 15.8% | | | | | | |
| 17 | 3 | 15.0% | | 0.0% | | | | |
| 18 | 3 | 14.3% | 4 | 18.2% | | | | |
| 19 | 4 | 17.4% | | | | | | |
| 20 | 4 | 16.7% | 5 | 20.0% | | | | |
| 21 | 4 | 16.0% | 5 | 19.2% | | | | |
| 22 | 4 | 15.4% | 5 | 18.5% | | | | |
| 23 | 4 | 14.8% | 5 | 17.9% | 6 | 20.7% | | |
| 24 | 4 | 14.3% | 5 | 17.2% | 6 | 20.0% | | |
| 25 | 5 | 16.7% | 6 | 19.4% | | | | |
| 26 | 5 | 16.1% | 6 | 18.8% | 7 | 21.2% | | |
| 27 | 5 | 15.6% | 6 | 18.2% | 7 | 20.6% | | |
| 28 | 5 | 15.2% | 6 | 17.6% | 7 | 20.0% | | |
| 29 | 5 | 14.7% | 6 | 17.1% | 7 | 19.4% | | |
| 30 | 5 | 14.3% | 6 | 16.7% | 7 | 18.9% | 8 | 21.1% |
| 31 | 6 | 16.2% | 7 | 18.4% | 8 | 20.5% | | |
| 32 | 6 | 15.7% | 7 | 17.9% | 8 | 20% | | |
| 33 | 6 | 15.3% | 7 | 17.5% | 8 | 19.5% | 9 | 21.4% |

Table of MEA Scores Contributed Based on the Number of Performance Indicator Scores in the LAS for a Cluster

| Number of PI scores in Cluster | Number of MEA scores used | resulting percent weight | Number of MEA scores used | resulting percent weight |
|--------------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| 5 | 2 | 28.6% | | |
| 6 | 2 | 25.0% | | |
| 7 | 2 | 22.2% | 3 | 30.0% |
| 8 | 3 | 27.3% | | |
| 9 | 3 | 25.0% | 4 | 30.8% |
| 10 | 3 | 23.1% | 4 | 28.6% |
| 11 | 4 | 26.7% | 5 | 31.3% |
| 12 | 4 | 25.0% | 5 | 29.4% |

Pattern of Performance at the Content Area Level

Case 1: Fran meets standards on the MEA (MEA weight = 20%)

Fran's scores (mode = 2 on local assessments)

| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
|-------------------------|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 3 | | | | 2 | 3 | |
| #2 | | | | | 3 | | | | | 2 | 2 | | |
| #3 | | | 2 | | | | | | | | 3 | 2 | |
| #4 | | | | | 2, 2 | | | | | | | | |
| #5 | | 2, 2 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 2, 2 | | | | 2 | 2 |
| #7 | | | | | | | | 3 | | 3 | 2 | 3 | |
| #8 | | | | | | 2 | | | | 2 | | 2 | |
| #9 | 3 | | | | | | | | | 3 | 2 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 12/20 | | | 12/20 | | | 13/20 | | | 35/60 | | | |
| 18 2s, 12 3s → mode = 2 | | | | | | | | | | | | | |

Fran obtained 18 **2s** and 12 **3s** on the local assessments in science & technology, giving her a mode of **2** (partially meets the standard).

There are 30 performance indicator scores in the LAS. Looking at the table for 30 performance indicators the indicated number of scores is between 7 and 8. Since they appear to be equidistant from the target of 20%, 8 is chosen.

If Fran partially meets standards on the MEA, this matches her pattern of performance (2) but does not help her so **the MEA score is not used**.

If Fran meets standards on the MEA, this is higher than her mode of 2 so the MEA is added in to the mix. The resulting distribution of scores is:

eight 3s from the MEA, **twelve 3s** from the LAS and **eighteen 2s** from the LAS
which is **twenty 3s** and **eighteen 2s**

Fran meets standards on the combined measures.

If Fran exceeds standards on the MEA, this is higher than her mode of 2 so the MEA is added in to the mix. The resulting distribution of scores is:

eight 4s from the MEA, **twelve 3s** from the LAS and **eighteen 2s** from the LAS
this still has a mode of 2,
but when rule 2 is applied changing the 4s to 3s the resulting distribution yields
twenty 3s and **eighteen 2s**

Fran meets standards on the combined measures.

Case 2: Ernie (MEA weight = 15%)

Ernie's scores (mode = 2 on local assessments)

| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
|--------------------------|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 2 | | | | 2 | 2 | |
| #2 | | | | | 3 | | | | | | 2 | | |
| #3 | | | 2 | | | | | | | | 3 | | |
| #4 | | | | | 2, 2 | | | | | | | | |
| #5 | | 2, 2 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 2, 2 | | | | | 2 |
| #7 | | | | | | | | 2 | | 2 | 2 | 3 | |
| #8 | | | | | | 2 | | | | 2 | | 2 | |
| #9 | 2 | | | | | | | | | 3 | 2 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 11/20 | | | 12/20 | | | 11/20 | | | 27/48 | | | |
| 20 2's, 7 3's → mode = 2 | | | | | | | | | | | | | |

Ernie obtained 20 **2**'s and 7 **3**'s on the local assessments, giving him a mode of **2** (partially meets the standard).

There are 27 performance indicator scores in the LAS. Looking at the table for 27 performance indicators the indicated number of scores closest to the 15% level is 5.

If Ernie partially meets standards on the MEA, this matches his pattern of performance (2) but does not help him so **the MEA score is not used**.

If Ernie meets standards on the MEA, this is higher than his mode of 2 so the MEA is added in to the mix. The resulting distribution of scores is:

five 3s from the MEA, **seven 3s** from the LAS and **twenty 2s** from the LAS.

This is **twelve 3s** and **twenty 2s**.

Ernie does not yet meet standard on the MEA. He still benefits. With the LAS alone he needed to use replacement to change 7 of the 2 scores to 3s or 4s (becomes thirteen 2s and fourteen 3s). With the combined MEA –LAS he only needs to raise three 2 scores to 3s or 4s (becomes fifteen 3s and fifteen 2s).

In Ernie and Fran's cases the difference between a 4 and a 3 on the MEA is nonexistent using "pattern of performance." Both scores will help Ernie and Fran get closer to meeting standard or meet standard. This does not mean that "exceeds" can not be reached. Fran and Ernie were starting from partially meets. An example follows where the MEA makes it possible for a student to exceed standards with help from the MEA.

Case 3: Oscar (MEA weight = 20%)

Oscar's scores (mode = 2 on local assessments)

| | Life Sciences | | | Physical Sciences | | | Earth & Space Sciences | | | Nature & Implications of Science | | | |
|-------------------------------|---------------|------|---|-------------------|------|---|------------------------|------|---|----------------------------------|---|---|---|
| | A | B | C | E | H | I | D | F | G | J | K | L | M |
| Assessment | | | | | | | | | | | | | |
| #1 | 3 | | | | | | 3 | | | | 3 | 4 | |
| #2 | | | | | 3 | | | | | | 4 | | |
| #3 | | | 4 | | | | | | | | 3 | | |
| #4 | | | | | 4, 4 | | | | | | | | |
| #5 | | 4, 3 | | | | | | | | | | | |
| #6 | | | | 3 | | | | 4, 4 | | | | | 3 |
| #7 | | | | | | | | 3 | | 3 | 4 | 4 | |
| #8 | | | | | | 2 | | | | 3 | | 3 | |
| #9 | 2 | | | | | | | | | 3 | 4 | | |
| #10 | | | | | | | | | 3 | | | | |
| points earned: | 16/20 | | | 16/20 | | | 17/20 | | | 42/48 | | | |
| 11 4s, 14 3s, 2 2s → mode = 3 | | | | | | | | | | | | | |

Oscar's scores are strong, but not quite enough to show a clear pattern of 4s to exceed the standard.

If Oscar partially meets on the MEA, the scores of 2 do nothing for him so the **MEA is not considered**.

If Oscar meets standards on the MEA, the score of 3 validates the LAS result, but do nothing for Oscar so the **MEA is not considered**.

Oscar gains nothing and would have more 3s added in from the MEA to make up for if he were allowed to do replacements for some of the three scores to try for 4s.

If Oscar exceeds standards on the MEA, the 4 scores are higher than his current pattern of performance and should be added to his record of performance.

Using the table, at the 20% level for 27 performance indicator scores the number of scores contributed by the MEA is 7. Seven 4s will be added to Oscar's score distribution.

The resulting distribution is

seven 4s from the MEA with eleven 4s, fourteen 3s, and two 2s from the LAS.

This is eighteen 4s, fourteen 3s and two 2s. 4 is the most common score and the number of 4s is greater than or equal to one-half of the total number of scores, i.e. $18 > (\frac{1}{2})(34)$.

Thus Oscar exceeds standards using the combined measures.

Pattern of Performance at the Cluster Level (English Language Arts)

Like using pattern of performance with the content area, the first thing that needs to be done is select a number of scores to add for the MEA. For reading (LAS ELA Cluster 1) and writing (LAS ELA Cluster 2) this value is based on the size of the clusters and uses the second table scores. Note that the weights are between 25% and 30%. This is to make up for the fact that only two-thirds of the content area of English Language Arts is tested using the MEA. The larger percentage values are needed to meet the criterion that the addition of the MEA score be large enough to be meaningful to the student.

Case 1: Bert meets standards on MEA reading(3) and meets standards on MEA writing (3) (MEA at 25%)

Bert's scores (mode = 2 on local assessments)

| Ben's scores (mode = 2 on local assessment) | | | | | | | | |
|---|---------------------|------|---|----------------------|------|---|---------------------|------|
| | Reading and Viewing | | | Writing and Speaking | | | Integrated Literacy | |
| | A | B | D | E | F | G | C | H |
| Assessment | | | | | | | | |
| #1 | 3 | | | | | | 3 | |
| #2 | | | | | 2 | | | |
| #3 | | | 2 | | | | 3 | |
| #4 | | | | | 2, 2 | | | |
| #5 | | 2, 2 | | | | | | |
| #6 | | | | 3 | | | | 2, 2 |
| #7 | | | | | | | | 4 |
| #8 | | | | | | 2 | | |
| #9 | 3 | | | | | | | |
| #10 | | | | 2 | | | | |
| points earned: | 12/20 | | | 13/24 | | | 14/20 | |
| 1 4, 5 3s, 10 2s → mode=2 | | | | | | | | |

Reading

Bert's mode is currently a 2 so the MEA scores of 3 help him.

In Cluster 1 Reading and Viewing there are 5 scores. Using the table at 25%, 2 scores should be added. This is two scores of 3.

Writing

Bert's mode is currently a 2 so the MEA scores of 3 help him.

In Cluster 2 Writing and Speaking there are 6 scores. Using the table, again 2 scores should be added. Add 2 more scores of 3.

Bert's new distribution is:

4 3s from the MEA and one 4, five 3s and 10 2s from the LAS.

The combined distribution is one 4, nine 3s and 10 2s. Using rule 2 the 4 may be counted as another 3 leaving Bert with ten 3s and ten 2s and **Bert meets standards** (by the hardest) on the combined MEA-LAS.

Case 2 Bert meets standards on MEA Reading only. (MEA weight at 25%)

Bert's scores (mode = 2 on local assessments)

| Mode 2 on team assessment | | | | | | | | |
|-----------------------------|---------------------|------|---|----------------------|------|---|---------------------|------|
| | Reading and Viewing | | | Writing and Speaking | | | Integrated Literacy | |
| | A | B | D | E | F | G | C | H |
| Assessment | | | | | | | | |
| #1 | 3 | | | | | | 3 | |
| #2 | | | | | 2 | | | |
| #3 | | | 2 | | | | 3 | |
| #4 | | | | | 2, 2 | | | |
| #5 | | 2, 2 | | | | | | |
| #6 | | | | 3 | | | | 2, 2 |
| #7 | | | | | | | | 4 |
| #8 | | | | | | 2 | | |
| #9 | 3 | | | | | | | |
| #10 | | | | 2 | | | | |
| points earned: | 12/20 | | | 13/24 | | | 14/20 | |
| 1 4, 5 3s, 10 2s → mode = 2 | | | | | | | | |

Bert's mode is a 2. A 3 on the MEA in Reading will help him so it is figured in.

Reading (scores of 3)

Bert's mode is currently a 2 so the MEA scores help him.

In Cluster 1 Reading and Viewing there are 5 scores. Using the table at about 25%, 2 scores should be added. This is two scores of 3.

Writing

Since Bert did not meet standard, additional scores of 2 or less will not help him so the MEA is not counted.

Cluster 3 is unaffected by the MEA

With the addition of the MEA scores for reading Bert's distribution is:

two 3s from the MEA and one 4, 5 3s and 10 2s from the LAS

the combined distribution is one 4, 7 3s and 10 2s.

Bert still partially meets standard with a mode of 2.

Bert does, however, benefit. There are now 8 scores that meet or exceed standard and 10 scores at partially meets standards. Using replacement, Bert needs to raise just one of the 2s to a 3 or 4 to meet standard (10 scores meet or exceed) on the combined measures.

Congratulate yourself on having made it through this guide. It is hoped that you have found the examples useful and your efforts worthwhile. Comments, questions and suggestions for improvement are very welcome. Please forward any that you have to the contacts listed on the cover page.